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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

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OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

MEMORANDUM

SUBJECT: EPA No. 1471-EUP-ON: Trifluralin (Treflan®), Experimental Use Permit for the chemigation application of trifluralin to alfalfa. Accession No. 256131. RCB No. 541

FROM: J. Garbus, Chemist
Residue Chemistry Branch
Hazard Evaluation Division (TS-769)

THRU: C. L. Trichilo, Chief
Residue Chemistry Branch
Hazard Evaluation Division (TS-769)

TO: R.F. Mountfort, PM-23
Registration Division (TS-767)

The Elanco Products Division of Eli Lilly and Company has applied for an experimental use permit for its herbicides Treflan® EC (EPA Reg. No. 1471-35), Treflan® M.T.F.™ (EPA Reg. No. 1471-116), and Treflan® 5 (EPA Reg. No. 1471-120). The products are to be applied to alfalfa through central pivot or lateral-move overhead irrigation systems equipped for chemigation. The objectives of the program are to determine optimal application rates and schedules for single and split applications in different alfalfa growing regions. The study will also demonstrate whether crops so treated with up to 2 lbs. a.i. of trifluralin per acre will contain residues in excess of the established tolerance of 0.2 ppm on alfalfa hay.

Treflan® is Elanco's registered trade-name for trifluralin, alpha, alpha, alpha-trifluoro-2,6-dinitro-N,N-dipropyl-p-toluidine. It is a selective herbicide used for the pre-emergence control of annual grasses and broadleaf weeds. Treflan® EC is an emulsifiable concentrate containing 44.5% a.i. (4 lbs/gal.); Treflan® M.T.F.™ is a multiple temperature formulation with 41.2% a.i. (4 lbs/gal.). Both these formulations are registered for use only on established stands of alfalfa in Western states. Treflan® 5 contains 50.8% a.i. (5 lbs/gal.) and is for use on established alfalfa in areas where rainfall "is less than 20 inches average annual per year". The rates of application for the various formulations are related to soil type; 1.5 pts./A (0.75 or 0.94 lbs a.i./A) broadcast on coarse soils and 2 pts./A (1 or 1.25 lbs a.i./A) on medium or fine soils. All labels emphasize that

trifluralin should be well incorporated into the soil with minimum damage to established plants.

The experimental program proposes the use of 150 gallons of Treflan® EC (600 lbs a.i.), 700 gallons of Treflan® M.T.F.™ (2800 lbs a.i.), and 200 gallons of Treflan® 5 (1000 lbs a.i.). Each of these formulations of trifluralin will be applied through chemigation to alfalfa in different growing areas. Treflan® EC will be used in the Southwest (AZ, NM, OK, and TX), Treflan® M.T.F.™ in the West Central region (CO, IA, KS, MN, and NE), and Treflan® 5 together with Treflan® M.T.F.™ in the Western region (CA, ID, OR, UT, and WA). The program is to last 1 year and begin on 2/1/85.

The usage pattern as given on the proposed label for the EUP states that: Treflan application may begin in the fall.... Spring applications may be made to dormant alfalfa, established alfalfa, or after an alfalfa cutting. The EUP protocol (Section G) states that: Single applications will be made to dormant or semi-dormant alfalfa in the later winter or early spring or prior to the last fall cutting. Split applications will be made both in late winter or early spring and after various cuttings up to the final fall cutting. According to the proposed label, the exact timing of the application will depend upon local cultural practices. The total amount applied per season should not exceed 2 lbs a.i./A. No distinction is made for soil type.

As now written the directions for use are ambiguous in that they do not explicitly state the time that should elapse between application and cutting. Although both label and the protocol rely upon good agricultural practice for the timing of applications and harvesting, we recommend that an explicit statement imposing a PHI of 30 days be made part of the label and protocol.

The supplemental labeling for the EUP emphasizes the need for a well maintained and well functioning chemigation system. Trifluralin should be applied at irrigation rates of 0.5 to 1 acre-inch of water. Trifluralin must be applied by systems having continuously moving lateral spraying arms providing a uniform distribution of water. Where there is non-uniform distribution such as at the extreme ends of booms, around support structures, at discharge outlets from water-powered motors, or where there are extreme changes in elevation, weed control will be affected and crop damage may occur.

Systems must have anti-siphon devices and check valves to prevent water source contamination and must have interlocking controls to insure the simultaneous cut-off of metering devices and water pumps. Injections of the herbicide must be made with a positive displacement pump into the main line ahead of right angles. Only the recommended amount of water is to be used to insure the proper concentration of herbicide.

Application is not to be made if there are system malfunctions, such as leaks, the non-uniform distribution of water,

the possibility of drift, or if the system is to be dismantled while still containing the product. Continuous agitation is necessary in the slurry tank and it is recommended that a large volume of slurry be injected over a prolonged time for greater accuracy and more uniform distribution.

The metabolism of trifluralin on alfalfa is considered to be well understood (See PPs 6F0565 and 6F0555). The major residues are the parent compound (ca. 80%) and monopropyl trifluralin. The analytical method for trifluralin (AM-AA-CA-R023-AA-755) included with this submission is a refinement of the original procedure described in PP6F0555 and included in PAM II. Basically the method involve the extraction of plant material with methanol, partitioning into dichloromethne, cleanup on Florasil, and GLC chromatography with quantitation with an EC detector. Sensitivity with the newer procedure is given as 0.008 ppm with 0.003 as the limit of detection. Recoveries for the analyses reported in this submission ranged from 81 to 108% with an average 95%. The storage stability of trifluralin in the presence of alfalfa hay held 8 months at -20°C is reported as 104%.

In support of this request for an EUP, Elanco has supplied residue data (Report ODD8412) for alfalfa teated with trifluralin applied by over-top spraying (OTS). In 8 trials conducted in 1984 in Kansas, California, and New Mexico the formulations Treflan® 5G, 5EC, TR-10, and 4M.T.F.™ were applied to the soil surface or by OTS at rates of 1.8 or 2.0 lbs a.i./A. Applications were made at the dormant stage or immediately after a cutting. Samples were taken from a first, second, and in some instances, third cutting 30 to 195 days after application. Residual trifluralin and water content were determined and residue levels normalized to a 20% moisture content. Residues of triflurin calculated for dry alfalfa hay ranged from 0.007 ppm to 0.028 ppm. The values correlated well (0.6) with the number of days between application and cutting.

Elanco's report concludes, "When Treflan® is applied at a 2.0 lb per acre rate to alfalfa at the dormant stage or just after cutting, according to normal agricultural practices, Treflan® residues should not exceed the current tolerance of 0.2 ppm on alfalfa hay." [Note, that the majority of the studies (i.e. 5 of 8) used to reach this conclusion were done with Treflan® TR-10, a formulation not included in the EUP.]

There are no prior residue data relating to residues from OTS application of trifluralin to alfalfa. Almost all of the residue data submitted to support the alfalfa tolerance petition 6F0565 were obtained from soil incorporation applications. That submission reports the analyses of 130 samples obtained in 42 trials. Only 6 of these samples were treated with a surface application. In this instance, a surface application was the application of spray or granules directed at the base of the plant but not incorporated into the soil. Only one sample was taken of alfalfa treated with

2 lbs. a.i./A of the liquid EC formulation. The dried hay had residues of 0.166 ppm 34 days after application but residues were non-detectable at a subsequent cutting 172 days after application. At an application rate of 1 lb ai./A of spray, residues were 0.058 ppm at 34 days and 0.014 at 172 days. These values were among the highest found in the residue trials. In a response to questions raised by RCB in regard to these high values, Elanco wrote that:

"We have been advised by our analytical staff that the trifluralin present was probably the result of incidental soil contamination..."

Nevertheless, the tolerance for trifluralin on alfalfa hay was set as 0.2 ppm.

In summary, all residue data, both from this submission using OTS application and from prior petitions with surface application demonstrate residues less than the established tolerance level of 0.2 ppm for trifluralin in or on alfalfa hay when treated at 2.0 lbs a.i./A.

Conclusions and Recommendations:

There are no residue data available for the chemigation method for applying trifluralin to alfalfa. However, as all residue data, both from this submission using over-top spraying and from prior petitions with surface application, demonstrate residues less than the established tolerance level of 0.2 ppm for trifluralin in or on alfalfa hay treated at 2.0 lbs a.i./A., we expect that similar residue levels will occur when the mode of application is chemigation. We therefore conclude that it is unlikely that the established tolerance of 0.2 ppm on alfalfa hay will be exceeded in the proposed EUP program.

Although the timing of the applications and good cultural practice would preclude the cutting of alfalfa soon after the application of the herbicide, we recommend that a PHI of at least 30 days be included on the current label.

We recommend that the EUP be granted for the amounts and time requested provided that a 30 day PHI is added to the label.

For permanent registration of this use, we will require residue data reflecting application by overhead sprinkler application (chemigation method).

cc: Amend. use F., S.F., R.F., Circ., Garbus
RDI:ARR;3/12/85:RDS:3/13/85
TS-769:CM#2:Rm810:xt73034:JG:jg:3/14/85